

Notice of Allowability

Application No.

09/557,719

Examiner

Joseph D. Anthony

Applicant(s)

YUNLU ET AL.

Art Unit

1714

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☐ This communication is responsive to _____.
2. ☒ The allowed claim(s) is/are 1-14 [renumbered as 1,4-6,2,7-8,3,9-14].
3. ☐ The drawings filed on _____ are accepted by the Examiner.
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☐ All b) ☐ Some* c) ☐ None of the:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☒ Information Disclosure Statements (PTO-1449 or PTO/SB/08),
Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit
of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☒ Interview Summary (PTO-413),
Paper No./Mail Date _____
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____

Joseph D. Anthony
Primary Examiner
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EXAMINER'S AMENDMENT

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Daniel P. Cillo (Reg. # 25,108) on 02/25/04.

The application has been amended as follows:

Claim 1 (amended) A process for producing a stable rare earth tris (organophosphate) solution or a stable rare earth tris (organophosphonate) solution or a stable rare earth tris (organophosphinate) solution comprising reacting an organophosphate salt solution or organophosphonate salt solution or organophosphinate salt solution, prepared by reaction of an acid and a base, with a rare earth salt in the presence of a solvent which is selected from the group consisting of hydrocarbon solvents, and mixtures of water and hydrocarbon solvents, [and mixtures thereof,] to form a rare earth tris (organophosphate) solution or a rare earth tris (organophosphonate) solution or a rare earth tris (organophosphinate) solution; wherein said rare earth tris (organophosphate) solution or a rare earth tris (organophosphonate) solution or a rare earth tris (organophosphinate) solution is stable from precipitation for at least about (15) days and contains from about 2% to about 10% by weight of rare

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earth element, and wherein said rare earth tris (organophosphate) solution or a rare earth tris (organophosphonate) solution or a rare earth tris (organophosphinate) solution has a free acid to rare earth element molar ratio of less than or equal to about 5.

Claim 9 (amended) A process for producing a stable rare earth tris (organophosphate) solution or a stable rare earth tris (organophosphonate) solution or a stable rare earth tris (organophosphinate) solution comprising the steps of:

a) reacting an organophosphate salt solution or organophosphonate salt solution or organophosphinate salt solution, prepared by reaction of an acid and a base, with a rare earth salt in the presence of a solvent which is selected from the group consisting of hydrocarbon solvents or mixtures of water and hydrocarbon solvents, to form a rare earth tris (organophosphate) solution or a rare earth tris organophosphonate salt solution or a rare earth tris organophosphinate salt solution, having an aqueous phase and an organic phase:

b) removing the aqueous phase;

c) washing the organic phase with water; and

d) adding a stabilizing additive selected from the group consisting of: water, acids, ester of acids, glycols (diols) and their ether derivatives and mixtures thereof;

wherein said rare earth tris (organophosphate) solution or said rare earth tris (organophosphonate) solution or said rare earth tris (organophosphinate) solution is stable from precipitation for at least about (15) days and contains from about 2% to about 10% by weight of rare earth element; and

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wherein the reaction temperature for step a) is greater than about 30° C and the stabilizing additive to rare earth element molar ratio is less than or equal to about 5.

Non-elected claims 15-17 are canceled.

2. The following is an examiner's statement of reasons for allowance:

The purpose of amended independent claims 1 and 9 to positively recite "organophosphonate salt solution or organophosphinate salt solution" and "or a stable rare earth tris (organophosphonate) solution or a stable rare earth tris (organophosphinate) solution" is to both CLEARIFY and EXPAND THE SCOPE of the claimed subject matter such that it is commensurate in scope with applicant's intention as set forth on page 4, line 30 to page 5, line 5 of the specification. It must be clearly pointed out that organophosphates have a definitive meaning in the art and DO NOT encompass organophosphonates or organophosphinates. As such, to clarify the scope of applicant's claims the examiner has proposed the said amendments. Furthermore, the claims as originally filed are indefinite as to what the metes and bounds are to the modifying word "stable" as found in the preamble of each independent claim. The above examiner's amendment of: "wherein said rare earth tris (organophosphate) solution or said rare earth tris (organophosphonate) solution or said rare earth tris (organophosphinate) solution is stable from precipitation for at least about (15) days and contains from about 2% to about 10% by weight of rare earth element;"

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clearly overcomes this indefinite issue and also clearly defines the subject matter of the claimed invention over the prior-art. Support for said examiner amendment is clearly set forth on page 2, lines 5-13 of applicant's specification.

Rare earth tris (organophosphates), rare earth tris (organophosphonates) solution and rare earth tris (organophosphinates) are well known in the art (see the examiner cited prior-art references and applicant's cited prior-art references). In any case, applicant's invention is drawn to a process of making rare earth tris (organophosphate) solution or said rare earth tris (organophosphonate) solution or said rare earth tris (organophosphinate) solution that is stable from precipitation for at least about (15) days and contains from about 2% to about 10% by weight of rare earth element. The solvent in said solutions is a hydrocarbon solvent or a mixture of a hydrocarbon solvent and water. None of the cited prior-art references teaches or fairly suggests a process of making applicant's claimed stable solutions.

The most relevant piece of prior art is the Article entitled: DEHP complexes of lanthanides (III) and actinides (III) which was cited by applicant. The article teaches a process of making oligomers or mixed ligand complexes of lanthanide(III) (2-ethylhexyl)phosphoric acid that are far more soluble in organic solvents than are the non-oligomers or mixed ligand complexes of lanthanide(III) (2-ethylhexyl)phosphoric acid. The process first involves making a first solution of sodium HEDHP in acetone, making a second solution of $\text{La}(\text{NO}_3)_3$ in acetone, and adding the two together and separating the $\text{La}(\text{HEDHP})_3$ precipitate from the solvent, see the bridging paragraph between columns 1-2. This method of making the La (III)

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organophosphate differs from applicant's claimed invention in a number of critical ways:

1) the solvent is acetone whereas applicant's claimed solvents are limited to a hydrocarbons or a mixture of hydrocarbons and water, and 2) the prior-art method does not produce a stable solution as claimed by applicant, because the lanthanide (III) organophosphate is precipitate right away from the acetone solvent. The Article's further disclosed process of making oligomers or mixed ligand complexes of lanthanide(III) (2-ethylhexyl)phosphoric acid are not deemed to be relevant to applicant's claimed method.

Another relevant prior-art reference is Edwards U.S. Patent Number 5,057,627. Edwards teaches alkoxylation process catalyzed by inorganic phosphate salts of the rare earth elements, see abstract, column 4, line 22 to column 5, line 8, and column 8, line 5 to column 9, line 22. Edwards teaches different process of making the rare earth inorganic phosphate salts in the examples. Example 1 teaches preparing a first solution by dissolving LaCl_3 in deionized water, preparing a second solution by dissolving sodium orthophosphate in water and then adding drop wise the first solution into the second solution to prepare a lanthanum phosphate precipitate. This examples differs from applicant's claimed invention in that: 1) this method produces an inorganic lanthanum phosphate whereas applicant's method produces rare earth tris organophosphate, 2) the solvent is water whereas applicant's claimed solvents are hydrocarbon or mixtures of hydrocarbons and water, and 3) the prior-art method does not produce a stable solution wherein the lanthanum

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phosphate is stabile suspended in solution as claimed by applicant's invention.

Example 6, is similar to example 1 but the solvent used is not water but rather ethoxyethanol and NEODOL, and alcohol. Although these are organic solvents they are not hydrocarbon solvents. Furthermore, the process produces inorganic lanthanum phosphate salts which are not stably suspended in solution.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Examiner Information

3. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner Joseph D. Anthony whose telephone number is (571) 272-1117. This examiner can normally be reached on Monday through Thursday from 8:00 a.m. to 6:30 p.m. in the eastern time zone. If attempts to reach the examiner are unsuccessful, the examiner's supervisor, Vasu Jagannathan, can be reached on (571) 272-1119. The centralized FAX machine number is (703) 872-9306. All other papers received by FAX will be treated as Official communications and cannot be immediately handled by the Examiner.



Joseph D. Anthony
Primary Patent Examiner
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3/8/04